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Ice Carver Ski

Related Applications

This patent application claims priority of Provisional Patent Application 60/418,589 filed on October 15, 2002, incorporated herein by reference.

Field of the Invention

This invention generally relates to skiing in icy conditions. More particularly, it relates to an improved edge for a ski. Even more particularly, it relates to an edge that provides greater control in icy conditions.

Background of the Invention

Icy conditions can make skiing difficult and hazardous. In good snow conditions, turning and stopping are accomplished by tilting the skis, causing their edges to cut into the snow. However, the ski edges cannot easily cut into ice. A common occurrence when attempting to turn on ice is that one or both ski edges fail to penetrate into the icy surface, the skis lose their hold, and the skier slips sideways downhill, resulting in a loss of control, and often a fall.

The present inventor found that no system is presently available that provides a skier with sufficient ability to maintain control in icy conditions. Thus, a better system for providing an edge cutting into or holding onto ice is needed, and this solution is provided by the following invention.

Summary of the Invention

It is therefore an object of the present invention to provide a device that improves control of skis in icy conditions;

It is a further object of the present invention to provide a device that increases the amount of edge on a ski;

It is a further object of the present invention to provide outrigger edges to increase the amount of edge touching the snow or ice surface when turning, stopping, or traversing, so as to improve control in icy conditions;

It is a feature of the present invention that outrigger edges are provided at edges of a bent metal plate that is removably connected to a top surface of the ski;

It is a feature of the present invention that outrigger edges are provided at edges of a bent metal plate that is integrated with a ski;

It is an advantage of the present invention that improved control is provided when skiing in icy conditions.

These and other objects, features, and advantages of the invention are accomplished with a device for skiing that includes a ski having a first side and a bottom surface. The bottom surface has a first edge on the first side. The ski further includes a first outrigger edge on the first side, wherein the first outrigger edge extends from the ski spaced from the first edge.

Another aspect of the invention is a method of skiing on snow or ice, comprising

the step of providing a ski having an outrigger edge. The method also includes the step of skiing on this ski. Finally the method includes the step of tilting this ski to engage the outrigger edge with the snow or ice.

Another aspect of the invention is a method of fabricating a ski for skiing on hard snow or ice. The method includes the step of providing a ski. The method also includes the step of providing a plate having outrigger edges. Finally the method includes the step of mounting this plate to this ski.

Brief Description of the Drawings

The foregoing and other objects, features, and advantages of the invention will be apparent from the following detailed description of the invention, as illustrated in the accompanying drawings, in which:

FIG. 1a is a three dimensional view of a ski having a removable metal plate connected to its top surface in which the plate includes the outrigger edges of the present invention;

FIG. 1b is a cross sectional view of the ski with the outrigger edges of FIG. 1a;

FIG. 2a is a cross sectional view of a ski with the outrigger edges of the present invention in which the outrigger edges are integrated with the ski;

FIG. 2b is a cross sectional view of another embodiment of a ski with the outrigger edges of the present invention in which the outrigger edges are integrated with an internal portion of the ski;

FIG. 3 is a cross sectional view of a ski with a plate having outrigger edges, in which the plate has two bends on each side of the ski to provide the outrigger edges at a lower position along a side surface of the ski;

FIG. 4a is a side view of a ski with outrigger edges in which the outrigger edges extend substantially along the entire side surface of the ski;

FIG. 4b is a top view of the embodiment of FIG. 4a showing windows in the metal plate for attaching heel and toe pieces of the binding directly to the ski, allowing the metal plate to be removed without removing the binding;

FIG. 5a is a side view of a ski with a metal plate having outrigger edges, in which the outrigger edges extend along several portions of the side surface of the ski;

FIG. 5b is a top view of the embodiment of FIG. 5a;

FIG. 6a is a three dimensional view of a a ski having a removable metal plate of the present invention in which the plate includes the outrigger edges with widely spaced serrations;

FIG. 6b is a three dimensional view of a a ski having a removable metal plate of the present invention in which the plate includes the outrigger edges and there is a second plate having serrations that can be attached to the removable metal plate;

FIG. 6c is a three dimensional view of a a ski having a removable metal plate of the present invention similar to the plate of FIG. 6a in which the plate includes the outrigger edges with closely spaced serrations;

FIG. 6d is a cross sectional view of a ski having a pair of removable metal plates

of the present invention in which each of the plates includes outrigger edges to provide a pair of outrigger edges on each side of the ski;

FIG. 6e is a cross sectional view of a ski having a removable metal plate of the present invention in which the plate includes the asymmetric outrigger edges;

FIG. 6f is a top view of a ski having a removable metal plate of the present invention in which the plate includes non-parallel outrigger edges;

Detailed Description of the Invention

Although the present invention can improve skiing with most types of skis and ski equipment, it is of particular advantage with modern shaped skis that have curved edges, such as parabolic edges. These skis are wider in front and rear portions of the ski compared to the middle portion. When turning or stopping shaped skis spread the pressure more evenly over the edge of the ski, resulting in sharper turns when snow conditions are good, but also reducing the ability of the ski to concentrate pressure in order to bite into ice.

Application of the present invention near the skier's center of gravity on a shaped ski improves ability to bite into ice and retain control while retaining the shaped skis advantages. The inventor has tested and used the present invention in this manner with superior results.

The present invention is also of particular advantage when used on skis with modern step-in bindings because these bindings leave the area under the skier's foot open, avoiding interference between the invention and the bindings. Thus, with step in bindings, the invention is more easily connected and disconnected from the ski and does

not interfere with the binding.

The present invention can also be applied to snowboards in a manner similar to that described herein below for skis in order to improve the ability of snowboards to retain control on ice. In this application the term "ski" applies to all kinds of skis and snowboards.

Outrigger edge 20a enhances ability to stop, turn, and traverse while maintaining control on ice or hard snow, as shown in FIG. 1a. Outrigger edge 20a is provided outside and spaced from normal edge 22 of ski 24. Outrigger edge 20a is also elevated a distance D above normal edge 22 so outrigger edge 20a only makes contact with the snow or ice when ski 24 is tilted through approximately angle A with respect to surface 26 of the snow or ice, as shown in FIG. 1b. Angle A is preferably in the range from 30 to 60 degrees, more preferably around 45 degrees to reduce or avoid contact during skiing on flat terrain but to allow contact when needed when manoeuvring on ice. Outrigger 20 is fabricated of a material such as 14 gauge stainless steel. It could also be fabricated of a material such as titanium or aluminum. It could also be fabricated of a ceramic composite or a durable plastic.

A skier generally tilts ski 24 with respect to surface 26 while turning or stopping. The skier may also tilt ski 24 with respect to surface 26 while traversing on a steep slope. The skier tilts ski 24 by shifting his or her weight to one side of the ski, and this pressure first causes normal edge 22 to bite into the snow or ice. Once a sufficient angle of tilt has been achieved, outrigger edge 20a touches the snow and bites into the surface as well. Outrigger edge 20a improves control in icy conditions by facilitating greater penetration or "bite" into surface 26 of the ice or by adding drag in such circumstances.

The actual angle for outrigger 20a to contact surface 26 of the snow or ice may be less than angle A, depending on the depth of penetration of normal edge 22 into the snow

or ice. With greater such penetration of normal edge 22 a shallower angle than angle A may achieve contact. In testing the invention, the present inventor found that outrigger 20a does not interfere with skiing on softer snow where easier penetration of normal edge 22 allows contact with surface 26 with lesser tilt than angle A.

The more the skier tilts ski 24 with respect to the snow surface, the more pressure will be exerted on normal edge 22 and on outrigger edge 20a. By contrast, when the skier is tilting ski 24 only slightly with respect to the snow surface, outrigger edge 20a will not reach surface 26 of the snow or ice so skiing will not be affected by its presence.

Outrigger edge 20a may be easily provided to ski 24 by attaching metal sheet 28a to ski 24. Metal sheet 28a is bent at angle B on each side of ski 24, as shown in FIG. 1b to provide outrigger edge 20a on each side. Metal sheet 28a with outrigger edges 20a can thus be added to ski 24 as needed to handle a day having icy conditions. Alternatively, outrigger edge 20a' can be integrated with ski 24', as shown in FIG. 2a. It can be integral with top surface 32 of ski 24', as shown in FIG. 2a, or it can be integral with an inner portion of ski 24", so it extends outwardly from a lower portion of side surface 30 of ski 24", as shown in FIG. 2b. Thus, outrigger 20a may either be a separate part attached to ski 24, as shown in FIG. 1a or it may be integral with ski 24', 24", as shown in FIGS. 2a, 2b. Metal sheet 28a', 28a" for outrigger 20a', 20a", integrated with ski 24', 24", may be permanently adhesively bonded to the adjacent layer or layers of ski 24', 24". Adhesives, such as epoxy can be used for the bonding.

Two bends can be provided on each side of metal sheet 28b to provide outrigger edge 20b extending from a lower position along side surface 30 of ski 24, as shown in FIG. 3.

Angle B, B' is preferably in the range from about 30 degrees to about 60 degrees, more preferably it is about 45 degrees. Metal sheet 28a, 28b is bent to have a width

between center bends approximately equal to the width of top surface 32 of ski 24, as shown in FIGS. 1a-1b to fit snugly on ski 24. Preferably metal sheet 28a, 28b has holes 36 drilled for mounting to ski 24 with screws 38.

Metal sheet 28c with edge 20c may be located spaced from entire edge 22 of ski 24, as shown in FIGS. 4a-4b. In this case windows are provided in metal sheet 28c to allow heel and toe pieces of the binding (not shown) to be directly mounted to ski 24 and to allow metal sheet 28c to be removed without interfering with the binding. Alternatively, separate metal sheets 28d with edges 20d may be provided on either side of location 38 for a ski binding (not shown) that is to be mounted to ski 24 for holding the skier's boot, as shown in FIGS. 5a-5b.

Saw teeth serrations 40 can be provided along at least a a portion of edge 20e of metal plate 28e, as shown in FIG. 6a. Saw teeth serrations 40 can be cut into edge 20e of metal plate 28e. Alternatively, saw teeth serration plate 41 can be applied to edge 20f later with screws 42, as shown in FIG. 6b.

Saw teeth serrations 40 on metal plate 28e can be widely spaced, as shown in FIG. 6a or they may be more closely spaced serrations 40' on at least a portion of edge 20g of metal plate 28g, as shown in FIG. 6c. Alternatively multiple outrigger edges, such as pair of outrigger edges 20h, 20h', on plates 28h, 28h' can be provided on each side of ski 24, as shown in FIG. 6d. Other kinds of outrigger edge modifications can be provided instead of serrations 40, 40', such as asymmetric edges 20i, 20i' on plate 28i, as shown in FIG. 6e, or non-parallel edges 20j, 20j' on plate 28j, as shown in FIG. 6f.

While several embodiments of the invention, together with modifications thereof, have been described in detail herein and illustrated in the accompanying drawings, it will be evident that various further modifications are possible without departing from the scope of the invention. Nothing in the above specification is intended to limit the

invention more narrowly than the appended claims. The examples given are intended only to be illustrative rather than exclusive.

What is claimed is: